

STEM Projects & Activities Reenergizing the Classroom (SPARC) Lab



Overview

SPARC Lab Projects

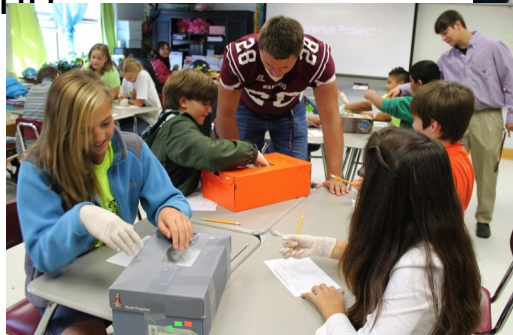
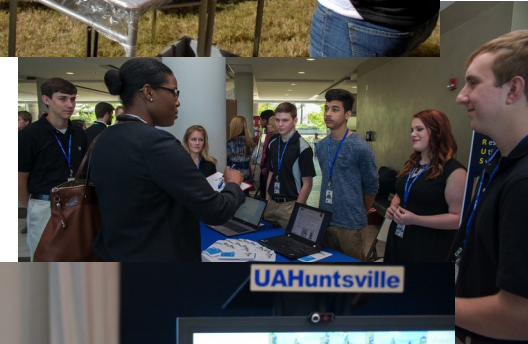


- Innovative System Project for the Increased Recruitment of Emerging STEM Students (InSPIRESS)
 - Conceptual design of a scientific payload for a planetary science mission
 - Interaction with college undergraduate students
 - Community Engagement Activity (CEA) events engage local community in project
 - Three component competition: proposal, open house, final review
- High Altitude Balloon Satellite (HABSat)
 - Hardware focused activity using a high altitude balloon as a platform
 - Portable (can be used in multiple grade levels)
 - Flexible (time involvement is at teacher's discretion)
 - Students experience entire mission life cycle

InSPIRESS History



- 7th year of operation
- Supported by Planetary Missions Program Office
- Phenomenal growth
 - Average of 20 high schools per year with 350-400 students
 - Highest year with 495
 - Expansion throughout North AL, Southern TN, and El Paso, TX
- Positive results
 - Students interested in STEM careers
 - Self-efficacy higher in STEM
 - Transforming classroom
- CEA event attendance growing
 - AY 13/14 - 18,016 visitors
 - AY 14/15 - 30,084 visitors



HABSat History



- Pre-pilot spring 2015
 - Used ISE course to determine interest
- Initial funding/hardware from SMDC task
- Schools involved
 - High school: Vinemont, Da Vinci, Scottsboro, Hartselle
 - Middle school: Mountain Gap, Chapman, Challenger, Buckhorn Central, Riverton Intermediate, Union Hill, Priceville Jr. High
 - Elementary: Morris, Priceville, Monrovia, Columbia
- Total of 5,685 students impacted



AY 15/16 Operating Plan



- InSPIRESS

- Fall/Spring competitions
- Goals
 - 25 high schools
 - 500 high school students
 - 35,000 CEA visitors
- Expansion
 - North Alabama
 - El Paso, TX
 - Charleston, SC
 - North Dakota
- Challenge
 - Develop Titan balloon given DRM
 - Potential CEA – balloon launch

- HABSat

- Fall/Spring – pilot
- Goals
 - 8-10 schools @ each level
 - 7500 students involved
- Sr. design class (UAH)
 - Develop, manufacture, and qualify flight payloads
 - High school
 - Middle school
 - Elementary
 - Map to grade-level curriculum standards
- ISE internship class
 - Conduct launches and recover payloads

SPARC Lab Semester

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18



Requirements,
Alternatives, & Decision
Analysis

PSR

Engineering Analysis
& Detailed Design

PC
R

Design
Refinement

FR

HABSat

High
School

UAH Launch

Mission Planning

Introduction
Calculations &
Prediction

FRR

Data Analysis & Lessons Learned

PFR

Teachers can elect to stop
after 1st flight & proceed to
PFR

High School
Launches

UAH Launch

UAH Launch

Middle
School

Introduction
Data Analysis &
Lessons Learned

PFR

Introduction
Data Analysis &
Lessons Learned

PFR

Introduction
Data Analysis &
Lessons Learned

PFR